

OWNING IT: AN EVALUATION OF LANGUAGE APPLICATIONS AND
SOFTWARE FOR SECOND LANGUAGE ACQUISITION MASTERY

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Abstract

As learner populations have become more culturally and linguistically heterogeneous, technology has created learner-centered environments that incorporate digital-based literacies, foster personalization of content, and build technological competencies through opportunities that increase linguistic and cultural knowledge and enhance technical skills. This paper identifies applications that can be used in PK-12 instruction to support Second Language Acquisition.

Keywords:

Second Language Acquisition

Applications

Hello Hello World

Duolingo

Mango Languages

Audacity

Mind Snacks

Technology

Introduction

Increasingly global economies, a heightened need for national security and changing national demographics have drawn increased attention to the lack of language capabilities in the U.S. and prompted a call to action: prepare students for the 21st century by offering them opportunities to learn languages other than English and to increase their knowledge of other cultures (Partnership for 21st Century Skills, 2011). In its 2010 National Education Technology Plan, the U.S. Department of Education referred to schools as information factories, stating that they must transform the dynamics of the K-12 classroom environment into incubators of exploration and invention that fully engage students (2010).

Today's educational models have further evolved to include a learner-focused view of education which utilizes technology to develop and modify tasks on the basis of clear language pedagogy that is both learner-centered, cognitively sound, and provides teachers with additional tools to assist them in meeting the needs of increasingly diverse student populations (Hoven, 1999; Meskill & Quah, 2012). The use of technology in English language teaching and learning can not only meet diverse learning needs, but also encourage the development of strategies necessary for modern survival: communication, collaboration, and information gathering and retrieval (TESOL, 2008). Preparing students for the information society should be one of the fundamental aims of today's education (U.S. Department of Education, 2010; OECD, 2000; European Commission, 2001). Technology is helping to change the nature of learning and instruction from a pencil-and-paper environment where students are passive learners to more sophisticated learning environments that incorporate digital-based literacies, socialities and technological competencies (Edwards-Groves, 2012). Learners have shifted from a homogenous group consisting primarily of English-only speakers to a heterogeneous

mixture of students from different cultural and linguistic backgrounds, thus requiring innovative approaches to delivering instruction to increasingly diverse student populations. Research has shown that the incorporation of technology will help level the playing field throughout K–12 education—particularly across racial, gender, and geographic divides (Noeth & Volkov, 2004). Teachers can accommodate individual students learning needs by utilizing technology to offer more options and by tailoring the curriculum to individual students' needs (Noeth & Volkov, 2004). This paper identifies applications (referred to from here as apps) and software programs that K-12 teachers can use to support Second Language Acquisition (referred to from here as SLA) in K-12 academic settings.

Problem Statement

Language education is critical to students' success in the world of the future that will insist upon students' abilities to interact effectively with others who do not speak English. It is critically important that schools, elementary through post-secondary, offer students an opportunity to develop those skills (Partnership for 21st Century Skills, 2011). Research has shown that language learners need to be able to make personal connections to instruction that takes place in the classroom (Dörnyei, 2005; Edwards-Groves, 2012; U.S. Department of Education, 2010). When learners develop and connect to concepts and ideas in their own way, the depth of their learning and their capacity for understanding increase, which helps them to more fully develop the skills necessary for successful second language acquisition (Dörnyei, 2005). Technology can be beneficial tools in helping students make connections to relevant educational topics while working simultaneously to acquire a second language (Noeth & Volkov, 2004; TESOL, 2008). Technology, apps and software that allow students to work at an

individualized pace are needed to afford students the opportunity to more fully develop SLA skills and electronic literacy skills (TESOL, 2008).

Situational Context

Over the years, classroom technology has become more complex and sophisticated as learning environments have moved from the use of slates to multimedia classrooms (Baker & Baker, 2004). As the needs of learners become increasingly diverse, teachers are turning to emergent technologies to meet their educational needs. This evaluation project seeks to fully explore the effectiveness of apps and software in building the listening and speaking skills of second language learners in K-12 learning environments.

Description of Population

Research for this study was conducted at an elementary school (School A) and a high school (School B) in Cherokee County, Georgia. School A is a public elementary school that serves students Pre-Kindergarten through sixth grade. Approximately 50% of the population consists of students from other countries, cultures, or ethnic groups. Of these students, 64% are being served in ESOL (English to Speakers of Other Languages) owing to their limited English language skills. The current demographics of the student population are 39% Caucasian and 46% Hispanic, and African-American children (18%) constitute the second largest minority group. Seventy-nine percent of students at School A receive free or reduced-price breakfast and lunch. Ninety-three percent of these students are on free breakfast and lunch while 7% are reduced breakfast and lunch.

School B is a public high school with grades nine through twelve. The student population is comprised primarily of Caucasian students (74%), with the remaining 26% of the student population consisting of five other ethnic groupings: Hispanic (12%), African-

American (7%), Asian (3%), Multi-racial (3%), and unspecified race (1%). The ratio of male to female students in the building is nearly 1:2 with a female student population of almost 51 % and a male student population of 49%. Slightly more than one quarter of School B's population (28%) qualifies for free and reduced lunch. Approximately 20% of the students are enrolled in gifted programs, 12% are enrolled in special education programs, and less than 1% is enrolled in the school's ELL (English Language Learner) program.

Rationale for the technology adoption

This software evaluation was designed to identify apps and software programs that K-12 teachers and learners can use to supplement and enrich instruction geared at SLA. This project evaluated five language acquisition apps and software programs for cost-effectiveness ease of use, accessibility, and teacher perceived effectiveness in building the listening and speaking skills of second-language learners. The following applications and software programs were selected for further review and user evaluation based on their high usability across multiple devices, including iPad®, iPhone®, iPod touch®, Android™, and PC devices; their ease of use; and their minimal cost of implementation: Hello-Hello World, Duolingo, Audacity, Mango Languages, and MindSnacks. Product evaluations, peer-reviewed literature, and a pilot study will drive the recommendations for their use as supplemental tools to further development of listening and speaking skills in second language learners and K-12 academic settings.

Literature Review

Theoretical Framework

Several authors (Bruner, 1966; Piaget, 1967; Vygotsky, 1962; & Yuvaraj, 2009) have examined the link between cognitive development and language development in children as

related to their age. While each had varying views on whether language exerts an effect on children's structure of thinking, all conceded that the child's individual needs and interests are of paramount importance when seeking to further development of communication in any language. According to Yuvaraj, children need ample opportunities to learn a foreign language based on the links between language, instruction and communication in the development of their knowledge and understanding of language concepts (2009).

The use of SLA research prior to the 1970s emphasized addressing cognitive variables such as intelligence, language aptitude or learning styles, to drive instructional design. Gardner and Lambert changed these prevailing thoughts when their research showed the importance of considering language learners' emotional variables as factors that may facilitate or hinder language acquisition (1972). Krashen's (1987) theory of second language acquisition and subsequent affective filter hypothesis served to show how factors such as learner anxiety, motivation, and self-confidence can facilitate or impede acquisition by raising or lowering learners' affective filters. Technology can bridge these variables and provide learners with new, personalized, and interactive methods to support SLA in the classroom (TESOL, 2008).

Literature Discussion

Wu, Yen, and Marek (2011) stated that "technology makes it possible to provide opportunities more commonly found only when there is a surrounding population of native speakers, and thus helps transform traditionally passive learners into more engaged and interactive learners" (p. 127). Recent work has contributed to the knowledge that acquisition through social interaction is a paradigm shift that has allowed the development of learner-centered, interactive curricula that in turn have spawned developments in technology and social learning shown to be more beneficial to students than traditional learning in the classroom

(Davies, 2011). With these developments, students have been able to build their sense of belonging, better communication skills, and improve computer competence while communicating with a greater variety of students simultaneously. This has provided students with the opportunity to shape content collaboratively within an interactive world (Davies, 2011).

Acquiring Language.

Cummins (1979) noted that there are two forms of language developed in the acquisition process and made the distinction between basic interpersonal communicative skills (BICS) and cognitive academic language proficiency (CALP) as a way to define the time it takes for second language learners to acquire skills necessary to succeed in school. Emergent technologies have demonstrated the ability to support the development of CALPs by using communicative and interactive tasks with which students can acquire and improve upon their linguistic skills, academic vocabulary, make content from the subject areas more accessible, and build confidence (Meskill & Mossop, 2000; Dunkel, 1990). Hoven (1999) stated that by taking into account “learners' needs and making provision for learner choice in this way, one of the major advantages of using computers in language learning, their capacity to allow learners to work at their own pace and in their own time, can be more fully exploited” (p. 102).

Apps and Software Relevance to SLA.

Rather than considering a piece of learning technology in isolation, it is important to think about the aims and objectives of a piece of software relative to its planned usage (Hoven, 1999). Language acquisition occurs in context because students learn language best when there is an emphasis on relevant, meaningful content rather than on the language itself (Arnold & Brown, 1999). Rich contexts made up of visual and auditory information provide environments

in which learners can become immersed and involved, and with which they can in turn make sense of and produce meaningful language (Meskill, 1991a, 1996). Language achievement in education can be attributed to the success of language acquisition in regards to extent of time, the intensity of use, and the quality of exposure to the second language (Krashen, 1987; Richards & Rogers, 2001; Arnold & Brown, 1999).

Elementary Apps: Hello-Hello World & Duolingo

Hello-Hello World utilizes a research-based mobile immersion methodology developed in collaboration with ACTFL, the American Council on the Teaching of Foreign Languages. ACTFL is the only national organization dedicated to the improvement and expansion of the teaching and learning of all languages at all levels of instruction (Hello-Hello World, 2013).

Leading the innovation on mobile education, Hello-Hello launched Hello-Hello World, the world's first mobile app that integrates language learning with social networking directly from mobile devices. App users can access courses in eleven different languages and connect with the Hello-Hello global community of language learners to find native speakers for the language they are learning. Users can send written and recorded exercises for their friends and language experts to review, plus the app also allows users to provide feedback on their friends' exercises (Hello-Hello World, 2013).

Duolingo, another free language learning app, also works based on the mobile immersion methodology by allowing users to acquire languages (English, Spanish, French, German and Portuguese are supported currently) by progressing through a set of skill exercises, with virtual rewards to make the learning experience more engaging and effective. The free iOS app that Duolingo offers makes it easy for students to study wherever they go.

Duolingo and Hello-Hello World are both designed to incorporate mobile immersion methodology that engage and encourage learners to acquire usable language skills quickly by creating a unique virtual environment that guides the learner visually to develop functional language skills (Hello-Hello World, 2013). Mobile Immersion methodology consists of a program that was 1- notional-functional in its approach to language teaching where students are being taught to communicate about real world topics and where new vocabulary and phrases are applied to actual functions that the learner will need to perform in a real life setting, 2- incremental by gradually adding communicative functions that become more complex as new words and phrases are introduced in each lesson to complement and reinforce previously learned concepts and is 3- learner-centered to maximize language acquisition, which gives the learner control to develop the skills needed to function in the new language at the level and pace desired thereby allowing for multiple levels of access to learning the language to accommodate diverse backgrounds.

Middle School Apps: Duolingo and MindSnacks.

Duolingo and MindSnacks were determined to be a solid fit for middle school language learners based on the social and cognitive levels of students in grades six through eight together with an increased likelihood of learners owning handheld devices that better facilitate opportunities for anytime-anywhere learning. Duolingo works by presenting users with activities ranging from exercises to complete lessons which are part of larger units. The structure is clear, shown on a tree in Duolingo, and the app tracks user progression through the lessons. The app also affords users the ability complete translations; upon successful completion of a prescribed number of lessons, learners have the option to practice by translating real content from the web into English.

MindSnacks is an app consisting of educational games in the area of foreign language as well as core curriculum areas. The app presents learners with speed-based games designed to test language mastery at increasingly complex levels; students advance through the levels by demonstrating mastery. (MindSnacks, 2013a). At www.wired.com, Bradley gave the app a favorable review, noting that the Italian app tested for the review proved to be effective for both listening and reading (Bradley, 2012). Paszterko and iTunes both offered the MindSnacks app for download and included copies of MindSnacks self-reviews on their website as a product pitch/selling point combination. In testing the Spanish app from MindSnacks, Paszterko awarded it a 5/5 rating (Paszterko, 2010; MindSnacks, 2013b).

High school programs and software: Mango Languages and Audacity.

Mango Languages and Audacity were deemed to best fit high school-aged learners and their foreign language instructors based on the self-motivation required in learners to attune to the uses of these two programs. When Rosetta Stone discontinued its free online service to public libraries in 2008, Mango Languages entered the market and became a leading provider of self-study language learning tools in public and institutional libraries nation-wide, including the network of Marine Corps Community Services Libraries, (ACTFL, 2008; MMCS-News and Events, 2010; SmartBrief, 2010). Public libraries, in turn, began offering and continue to offer Mango Languages free of charge to it library card or account holders. Learners who choose or prefer not to access the program through this vein will find themselves paying fees to access to the program as an individual (Education World, 2009; Mango Languages, 2013).

Available for use on Mac ®, Windows ®, and other operating systems, Audacity is free, open source cross-platform software that allows the user to record and edit sounds (Audacity, 2013). This open-endedness allows language instructors create a variety of customized listening

and speaking activities specific to their instructional methodologies and curriculum. Audacity users can record live audio; convert older technologies such as cassette tapes or records into digital recordings or compact discs; edit a variety of sound files; cut, copy, splice or mix different sounds together; or even change a recording's pitch or speed. Such features are particularly important for L2 instruction at advanced levels and help students and teachers prepare for learner participating in pre-recorded listening and speaking activities that are particular to national-level language competitions such as those offered by the American Association of Teachers of Spanish and Portuguese, the American Association of Teachers of French, or AP ® examinations offered by the College Board ® (AATSP, 2013; AATSP, 2013; AATF, 2013; AP ® Students; 2013).

Methodology

Evaluation Design

Product review searches and literature searches were conducted to identify applications and software programs that offered high usability across different computer and handheld device technologies combined with ease of use by K-12 students and teachers and affordable implementation at little to no cost to the local school system. The searches conducted within these parameters narrowed the field to a handful of applications and software that merited further review and consideration via user evaluation and feedback through the usage of teacher and student surveys. The following applications and software programs were selected for further review and user evaluation via a pilot study based on their high usability across different technology-based computers and devices, their ease of use, and their minimal cost of implementation: Hello-Hello World, Duolingo, Audacity, Mango Languages, and MindSnacks. The pilot study was designed as follows: teachers and students from grades three through five

would be evaluating Duolingo and Hello-Hello World, teachers and students from grades six through eight would evaluate Duolingo and MindSnacks, and high school teachers of grades nine through twelve and students representative of those grade levels would evaluate Mango Languages and Audacity.

Rationale for the design

The purpose of this study was to advance SLA in K-12 classrooms by identifying software and apps that enrich and supplement language instruction. Based on findings in the literature review, learners acquire a second language by making use of existing knowledge of their native language, general learning strategies, or universal properties of language to internalize knowledge of the second language. These findings were used to select Hello-Hello World and Duolingo for testing in the K-5 setting, Duolingo and MindSnacks in the middle school setting, and Audacity and Mango Language in the high school setting. These applications were chosen for these specific grade levels based on student readiness, emotional variables, and age appropriateness of user content. The study design is intended to assist educators in determining the strengths and weaknesses of the utilization of incorporating these apps and software in instruction.

Evaluation Criteria

This study incorporated researcher review plus teacher and student surveys to evaluate five language acquisition apps and software programs for ease of use, accessibility, and effectiveness in building the listening and speaking skills of second-language learners. The researchers also evaluated each app and software program for widespread applicability across multiple devices, including iPad®, iPhone®, iPod touch®, Android™, and PC. Emphasis was placed on evaluating the software and apps, not the devices themselves.

Instruments.

Two Likert scale questionnaires were designed to elicit information from teachers and students to summarize the overall opinions about the usability and content of the apps and software being considered to supplement SLA. Both questionnaires included software or app usability inquiries plus learning objectives inquiries to better evaluate ease of use and to assess how well the apps and software supplemented learners' efforts to build listening and speaking skills. The student survey was comprised of seven questions designed to obtain information on student attitudes toward the applications and software programs in relation to ease of use, supportiveness in learning the material, and willingness to use the app again in their own time (see Appendix A). The teacher survey (see Appendix B) consisted of fifteen questions designed to allow teachers to express their knowledge and experiences regarding ease of use, accessibility, and effectiveness of software and apps in building the listening and speaking skills of second-language learners. This survey also included questions about the years of experience, degree of education, age, gender, and grade level taught.

Participants.

Participants for this study were students and teachers from Elementary School A and High School B. Teacher and student participants completed surveys (See Appendix A and B) that measured their perceptions about the ease of use, accessibility, and effectiveness in building the listening and speaking skills of second-language learners. All participants in this study were selected based on convenience sampling. At School A, eight student participants (two per grade level) and four teachers (one per grade for grades three through five, and two teachers from sixth grade) were selected randomly from classrooms in grades three through six. At School B, students in eight different sections of Spanish I were randomly selected to take

the survey. All students enrolled in Spanish I are in the ninth, tenth, or eleventh grade. Two of the three teachers who volunteered to participate in this survey teach these sections and began using Audacity with their students during the current school year; the third Spanish teacher does not teach Spanish I currently but has familiarity with and previous experience using Audacity.

Findings, Results and Recommendations

Students and teachers were asked to rate different apps and software for (a) accessibility, ease of use and satisfaction with use, (b) perceived relevance to the material being studied, and (c) overall appeal to students. Additionally, teachers were asked to rate the potential roles of the apps and software in SLS as related to: (a) assisting learners with building listening and/or speaking skills in another language, (b) how students might benefit from their usage, (c) their usage across multiple grade levels, and (d) their potential fit for current curriculum based on their content, their features, and their support of learning objectives. The survey results were analyzed to determine the value that students and teachers, as stakeholders, placed on the apps and software being considered for recommendation as supplements to SLA in the K-12 setting. The researchers examined peer-reviewed literature and conducted product reviews on the apps and software in researching usability across different technologies and devices, cost of implementation, feature benefits for users, accessibility, and SLA support. The researchers' findings and the pilot study results were then analyzed concurrently, and product adoption recommendations were developed based on these analyses.

Findings and Results

The researchers wish to preface the survey results by noting that teacher survey results provided ratings for Duolingo, Hello-Hello World, and Audacity only, and student survey

results were provided for all apps and software except Mango Languages. The cause of these survey gaps are unknown and will be discussed in the next section along with other limitations and reflections.

Table 1. Results for Accessibility, Ease of Use and Use Enjoyment

Evaluator groups	Duolingo (third – fifth grade only)	Hello-Hello World (sixth – eighth grade)	MindSnacks (sixth – eighth grade)	Mango Languages (ninth – twelfth grade)	Audacity (ninth – twelfth grade)
Students: Ease of use	67% = Strongly agree 33% = Agree	100% = Agree	*****	67% = Strongly agree 33% = Agree	67% = Agree 33% = Disagree
Teachers: Students would enjoy using app/program	67% = Strongly agree 33% = Agree	100% = Strongly agree	*****	*****	100% = Agree
Students: Enjoyed using app/program	100% = Strongly agree	50% = Strongly agree 50% = Agree	*****	67% = Strongly agree 33% = Agree	67% = Neither agree/disagree 33% = Disagree
Teachers: Ease of use	50% = Strongly agree 33% = Agree	100% = Agree	*****	*****	67% = Strongly agree 33% = Agree
Teachers: Easily accessed	33% = Agree 17% = Neither agree/disagree 50% = Disagree	100% = Disagree	*****	*****	60% = Strongly agree
Teachers: Confidence of use with students	66% = Agree	50% = Neither agree/disagree 50% = Disagree	*****	*****	33% = Strongly agree 67% = Agree
Teachers: difficulty with use	50% = Strongly agree 33% = Agree	50% = Agree 50% = Disagree	*****	*****	33% = Agree 67% = Neither agree/disagree

Table 1 shows the results of apps and software ratings for accessibility, ease of use and satisfaction with use, perceived relevance to the material being studied, and overall appeal to students. Only teachers were asked to respond to questions about accessibility, and their responses ranked it low across the board in all areas with at least half of all respondents disagreeing that the app or software was easy to access.

Both teachers and students responded to questionnaire items about app and software ease of use and satisfaction with use. Over 80% respondents from both evaluator categories indicated that they agreed or strongly agreed with ease of use for all apps. Teachers strongly agreed or agreed that students would enjoy using the evaluated apps or software (67%-100%), and actual student responses for Duolingo and Hello-Hello World match the teachers' predictions. Sixty-seven percent of students strongly agreed that Mango Languages was enjoyable to use, but there was no teacher prediction to compare to the student responses. The majority of students (67%) were ambivalent in their feelings about using Audacity (Neither agree/disagree), and the second largest group of Audacity ratings indicated that 33% of students surveyed gave Audacity use disagreeable ratings.

Teachers also responded to questions about their confidence of use the apps or software with students and difficulty of use. Between 30% and 50% of all teachers in each grade level grouping marked "Agree" in response to being asked if the apps and software were difficult to use, which contradicted their earlier answers that the apps and software were easy to use. This is likely the result of respondents not paying full attention to the wording of the question. Still, over half of the teachers surveyed (66%) agreed that they felt comfortable using Duolingo and Audacity with their students, but half disagreed that they were confident in their abilities to use Hello-Hello World with their students.

Only teachers were asked to rate the potential roles of the apps and software in second language instruction (see Tables 2 and 3). In responding to questions about content relevance to course material, the apps and software received the most favorable ratings for the potential that they held for differentiation and use in a SLA course (Duolingo = 67% Strongly agree, Hello-Hello World = 100% Strongly agree, Audacity = 33% Strongly agree). Half of the respondents for Duolingo and Hello-Hello World disagreed that the app and software content complemented course content; ratings for content customization and alignment between learning strategies and learning objectives were inconclusive. Feedback in these two areas was divided almost evenly among levels of agreement and disagreement.

Table 2. Teacher Perceptions of App/Software Relevance to Course Material

	Duolingo (third – fifth grade)	Hello-Hello World (sixth – eighth grade)	MindSnacks (sixth – eighth grade)	Mango Languages (ninth – twelfth grade)	Audacity (ninth – twelfth grade)
App/software content complements course content	17% = Agree 33% = Neither agree/disagree 50% = disagree	17% = Agree 33% = Neither agree/disagree 50% = disagree	*****	*****	34% = Strongly agree 33% = Agree 33% = Neither agree/disagree
Content customizable to course content	50% = Agree 17% = Neither agree/disagree 33% = Disagree	100% = Neither agree/disagree	*****	*****	33% = Strongly agree 34% = Agree 33% = Disagree
Content potential for differentiation and use in course	67% = Strongly agree	100% = Strongly agree	*****	*****	33% = Strongly agree 34% = Neither agree/disagree 33% = Disagree
Learning strategies in app/program align with course learning objectives	17% = Strongly agree 33% = Agree 33% = Neither	50% = Agree 50% = Neither agree/disagree	*****	*****	33% = Strongly agree 34% = Neither agree/disagree

	agree/disagree 17% = Disagree				33% = Strongly disagree
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Teachers also responded to survey items about how the apps and software assist second language learners with building listening and/or speaking skills in another language, specifically (a) how students might benefit from their usage, (b) how suitable the apps and software are to use across multiple grade levels, and (c) their potential fit for current SLA curriculum based on their content, their features, and their support of learning objectives (see Table 3).

Table 3. Teacher Perceptions of Apps and Software SLA Benefits for Students

	Duolingo (third – fifth grade)	Hello-Hello World (sixth – eighth grade)	MindSnacks (sixth – eighth grade)	Mango Languages (ninth – twelfth grade)	Audacity (ninth – twelfth grade)
Content would challenge students	100% = Strongly agree	100% = Strongly agree	*****	*****	33% = Strongly agree 67% = Agree
Content allows students to extend learning beyond course content	100% = Strongly agree	100% = Strongly agree	*****	*****	33% = Agree 34% = Neither agree/disagree 33% = Disagree
Potential appeal to students of different ability levels	67% = Strongly agree 33% = Agree	100% = Strongly agree	*****	*****	33% = Agree 67% = Neither agree/disagree
Useful to students experiencing difficulty with course content	67% = Strongly agree 33% = Agree	100% = Strongly agree	*****	*****	34% = Strongly agree 33% = Neither agree/disagree 33% = Disagree
Appropriate for use across	83% = Strongly agree	100% = Agreed	*****	*****	67% = Strongly agree

multiple instructional levels					33% = Agree
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Duolingo and Hello-Hello World received significant ratings in their abilities to assist SLA learners with building their listening and speaking skills. Teachers were unanimous in strongly agreeing that both provide content that would challenge students and allow them to extend their learning beyond course content. They indicated that they were in agreement and strong agreement overall (83%-100%) with Duolingo's ability to appeal to students of different levels, to provide assistance to students struggling with course material, and to serve students well across multiple instructional levels. Hello-Hello World fared even better in teacher ratings in these areas, received 100% agreement or 100% strong agreement in each. Teacher ratings in these areas for Audacity were more varied, with the program receiving its highest ratings for content that would challenge students and for its ability to be used across multiple levels (combinations of "Agree" and "Strongly agree" for 100%). Evaluators were more divided on their opinions about the program's abilities to extend learning beyond the course (33% = Agree), appeal to students of different ability levels (33% = Agree), and prove useful to students struggling with course content (34% = Strongly agree). All other ratings in these three areas fell into the category "Neither agree/disagree" or into the two disagreement categories.

Recommendations

The purpose of this project was to advance SLA in K-12 classrooms by identifying software and apps that enrich and supplement language instruction. After a pilot study and subsequent review of current research of five applications and software in K-12 instructional settings, it is recommended that the five identified apps and software be adopted in educational practice as a tool to support language instruction in K-12 settings. By analyzing results from the

pilot study, it was determined that the identified apps and software have the potential to assist second language learners with building listening and/or speaking skills in another language, specifically by addressing: (a) how students might benefit from their usage, (b) how suitable the apps and software were to use across multiple grade levels, and (c) their potential to support SLA curriculum based on their content, their features, and their support of learning objectives. The study design was intended to assist educators in determining the strengths and weaknesses of incorporating these apps and software in instruction. Based on the study purpose, literature review, and pilot study, the researchers recommend adopting Hello-Hello World and Duolingo in the K-5 setting, Duolingo and MindSnacks in the middle school setting, and Audacity and Mango Languages in the high school setting to support language instruction for individual students in conjunction with student readiness, emotional variables, and age appropriateness of user content.

Limitations and Reflections

Many variables impacted the outcome of this evaluation project and final product recommendations, particularly those related to data collection. The researchers solicited survey participation for the pilot study from many K-12 sources in an effort to have results from at least five participants representative of every teacher and student grade level group. The actual number of participants who responded to both surveys fell short of these expectations and yielded a results pool that was 20% percent smaller than anticipated (twenty-four participants total versus a minimum goal of thirty). Time constraints due to standardized testing in local school settings, particularly week-long administration of the Criterion-Referenced Competency Tests (CRCT) in the elementary classrooms, put further limitations on time delegated for students to use apps and software within the instructional setting.

This evaluation project served to critique and build upon the knowledge that will inform teachers about the use of apps in software in language instruction. As noted earlier, ongoing advances in technology and the rapid pace of change in global communications are impacting instruction in the classroom, including the way teachers and students can use emergent technologies to further the development of SLA skills. These advances afford students and teachers access to a variety of engaging and educational opportunities to create classrooms that are both innovative and focused on developing the growing needs of diverse students in a global society. As the focus of education continues to shift and emphasize 21st century learners, it is essential to understand that how we use technology is of greater importance than the technology itself. The technology adoptions recommended in this study emphasize are framed as ways to supplement instruction and learning, not supplant a teacher and direct instruction in a classroom setting. The researchers believe that the apps and software recommended here can provide additional learning opportunities for students as they work to improve their language acquisition skills, and continued research on utilizing technology to assist SLA in the area of K-12 education is recommended.

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Appendix A

Student Survey

Below, please mark which app or software program you tested. For the rest of the question,

Indicate your agreement with the description of the app or software program you tested.

Please select your grade level:*

- ☐ 3rd-5th grade
- ☐ 6th-8th grade
- ☐ 9th-12th grade

I tested the following app/software:*

- ☐ Audacity
- ☐ Duolingo
- ☐ Mango Languages
- ☐ MindSnacks
- ☐ Hello-Hello World

The app/software is easy to use.*

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neither agree nor disagree
- ☐ Agree
- ☐ Strongly agree

I enjoyed using the app/software.*

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neither agree nor disagree
- ☐ Agree
- ☐ Strongly agree

The app/software provided good advice on how to work through the activities.*

- ☐ Strongly disagree
- ☐ Disagree

- ☐ Neither agree nor disagree
- ☐ Agree
- ☐ Strongly agree

The app/software helped me learn about the subject I am studying.*

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neither agree nor disagree
- ☐ Agree
- ☐ Strongly agree

The material and activities on the app/software fit well with what I am studying in class.*

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neither agree nor disagree
- ☐ Agree
- ☐ Strongly agree

I would use this app/software on my own time by choice.*

- ☐ Strongly disagree
 - ☐ Disagree
 - ☐ Neither agree nor disagree
 - ☐ Agree
 - ☐ Strongly agree
-

Appendix B

Teacher Survey: Educator Apps and Software Evaluation

Please complete the following educator demographic information.

Please indicate your teaching level:*

Please indicate which grade level(s) you teach by marking all that apply:*

- ☐ 3rd-5th grade
- ☐ 6th-8th grade
- ☐ 9th-12th grade

Please indicate your current level of education:*

Including the current year, for how long have you been teaching in the K-12 setting?*

Gender:

- ☐ Male
- ☐ Female

Age in years:

- ☐ 21-25
- ☐ 26-30
- ☐ 31-35
- ☐ 36-40
- ☐ 41-45
- ☐ 46-50
- ☐ 50+
- ☐ 60+
-

1,Strongly disagree, to 5,Strongly agree,.						
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I think that the app/software content compliments my course content.*

1 2 3 4 5

Strongly disagree Select a value from a range of 1,Strongly disagree, to 5,Strongly agree,.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree
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I think that the app/software content allows students to extend their learning beyond my course content.*

1 2 3 4 5

Strongly disagree Select a value from a range of 1,Strongly disagree, to 5,Strongly agree,.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree
---	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	----------------

I think that the app/software content would appeal to students of different ability levels.*

1 2 3 4 5

Strongly disagree Select a value from a range of 1,Strongly disagree, to 5,Strongly agree,.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree
---	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	----------------

I think that this app/software would be a useful tool for students experiencing difficulty with course content.*

1 2 3 4 5

Strongly disagree Select a value from a range of 1,Strongly disagree, to 5,Strongly agree,.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree
---	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	----------------

I think this app/software can be accessed easily.*

1 2 3 4 5

Strongly disagree Select a value from a range of 1,Strongly disagree, to 5,Strongly agree,.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree
---	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	----------------

I had difficulty using this app/software.*

1 2 3 4 5

Strongly agree Select a value from a range of 1,Strongly agree, to 5,Strongly disagree,.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly disagree
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I think that this app/software is appropriate for use across multiple instructional levels.*

1 2 3 4 5

Strongly disagree Select a value from a range of 1,Strongly disagree, to 5,Strongly agree,.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree
--	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	----------------

Overall Ratings

Please provide your overall rating of the app/software you reviewed where "1" = Poor and "5" = Excellent.

App/Software Usability: Perceived overall ability for students to work through the content by themselves.*

1 2 3 4 5

Poor--Students would require extensive support to work through the content. Select a value from a range of 1,Poor--Students would require extensive support to work through the content., to 5,Excellent--Students would require no assistance to work through the content by themselves.,.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Excellent--Students would require no assistance to work through the content by themselves.
---	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	--

App/Software Features: Ease of customization to fit course requirements.*

1 2 3 4 5

Poor--The app/software affords no customization to align with course requirements. Select a value from a range of 1,Poor--The app/software affords no customization to align with course requirements., to 5,Excellent--The app/software can be customized easily to fit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Excellent--The app/software can be customized easily to fit course requirements.
--	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	--

course requirements.,.						
------------------------	--	--	--	--	--	--

Academic Content: Potential for differentiation and use in course instruction.*

	1	2	3	4	5	
Poor--The app/software is not suitable for inclusion in course instruction. Select a value from a range of 1,Poor--The app/software is not suitable for inclusion in course instruction., to 5,Excellent--The app/software would be a positive addition to course instruction.,.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Excellent--The app/software would be a positive addition to course instruction.

Attainment of Learning Objectives: The degree to which the learning strategies used in the app/software align with those of existing courses.*

	1	2	3	4	5	
Poor--The learning strategies fail to match those of existing courses. Select a value from a range of 1,Poor--The learning strategies fail to match those of existing courses., to 5,Excellent--The learning strategies are an excellent fit with those of existing courses.,.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Excellent--The learning strategies are an excellent fit with those of existing courses.

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Appendix C

Product	Duolingo	Hello-Hello World	Mango Languages	MindSnacks	Audacity
Application/ Software	Application (App)	Application (App)	Online Program	Application (App)	Software
Description of product	Acquire languages by progressing through a set of skill exercises, with virtual rewards	Language Learning / Social Networking: learn a new language and connect with native speakers around the world.* ACTFL supported	Online program: lesson-based language-learning.	Uses games, vocabulary, phrases and audio clips to drive learning.	Open source cross-platform software that allows the user to record and edit sounds.
Usability across devices	iPhone 3GS, 4, 4S, 5; iPod touch (3 rd , 4 th , 5 th generation); and iPad. Requires iOS 5.0 or later *Android App release 2013-2014 *Web-based version also available	iPad. Requires iOS 3.2 or later	iPhone, Android, MP3, Windows XP SP3 or Windows 7, Mac SnowLeopard (OS X 10.6) or higher	iPhone, iPod touch, and iPad. Requires iOS* 5.0 or later. App is optimized for iPhone 5.	Mac OS X®, Windows®, GNU/Linux, and other operating systems
Cost	FREE*iOS app	FREE*iOS app	Free app for iPhone or Android. Individual: \$79 for 1 Journey; \$132 for 2, \$179 for 3 Journeys.	Nine free mini-games. Full access to all 50 lessons for upgrade fee of \$4.99.	Free
Ease of use	<u>Pros</u> : Lessons available offline. Content structured, progress tracked and paced. <u>Cons</u> : Not available in many languages. Can't jump ahead without testing out of lessons.	<u>Pros</u> : Free, 11 languages, Mobile learning anytime, Interactive Videos, social networking <u>Cons</u> : Audio files separate download. Crowd-Sourcing; Prolonged usage/app structure—lack of tracking progress (can skip around)	<u>Pros</u> : No site license required after purchase. 40+ languages and 15+ English as a Foreign Language courses. <u>Cons</u> : Purchase required for learning to move beyond free demo.	<u>Pros</u> : No site license required after purchase. Offers six languages plus SAT Vocabulary <u>Cons</u> : Must purchase upgrade to access all 50 lessons.	<u>Pros</u> : Make live recordings; customizable; available in over 25 different languages. <u>Cons</u> : Not user-friendly to novices; familiarity with online manual and Audacity Wiki recommended for optimum use.
Suggested age range	Grades K-5t	Grades 4-8	Grades 6-12.	Grades 6-12	Teachers of K-12; students of grades 9-12
Accessibility	Internet connection required for use, lessons available offline	Internet connection required for use.	Internet connection required for use.	Lessons available offline.	Accessible directly from computer desktop
Support of SLA	Individualized feedback; tracks progress with award points and virtual badges. Learner-centered to maximize acquisition	Individualized feedback; Gives the learner control to develop skills needed to function in new language at pace desired. Allows access to multiple learning levels.	Learner-centered to maximize acquisition. Emphasizes speaking, reading and listening. Lessons written by native speakers	Selective repetition of words, phrases or concepts based on user answers to drive focused repetition	Allows the instructor to create learner-centered activities that develop listening comprehension and speaking skills.